



Maine Forest Service
Forest Entomologists

168 State House Station
(50 Hospital Street)
Augusta, ME 04333

Charlene.Donahue@Maine.gov
Allison.Kanoti@Maine.gov
Colleen.Teering@Maine.gov

(207) 287-2431

Invasive Insect Threats to Maine Forests

Developed April 2009 as a resource for Maine Forest Service Forest Rangers

What are invasive species?

- Are not naturally found in the area
- Cause harm to:
 - environment
 - economy
 - human health



Familiar invasive forest pests

Gypsy Moth



Browntail Moth



Chestnut Blight

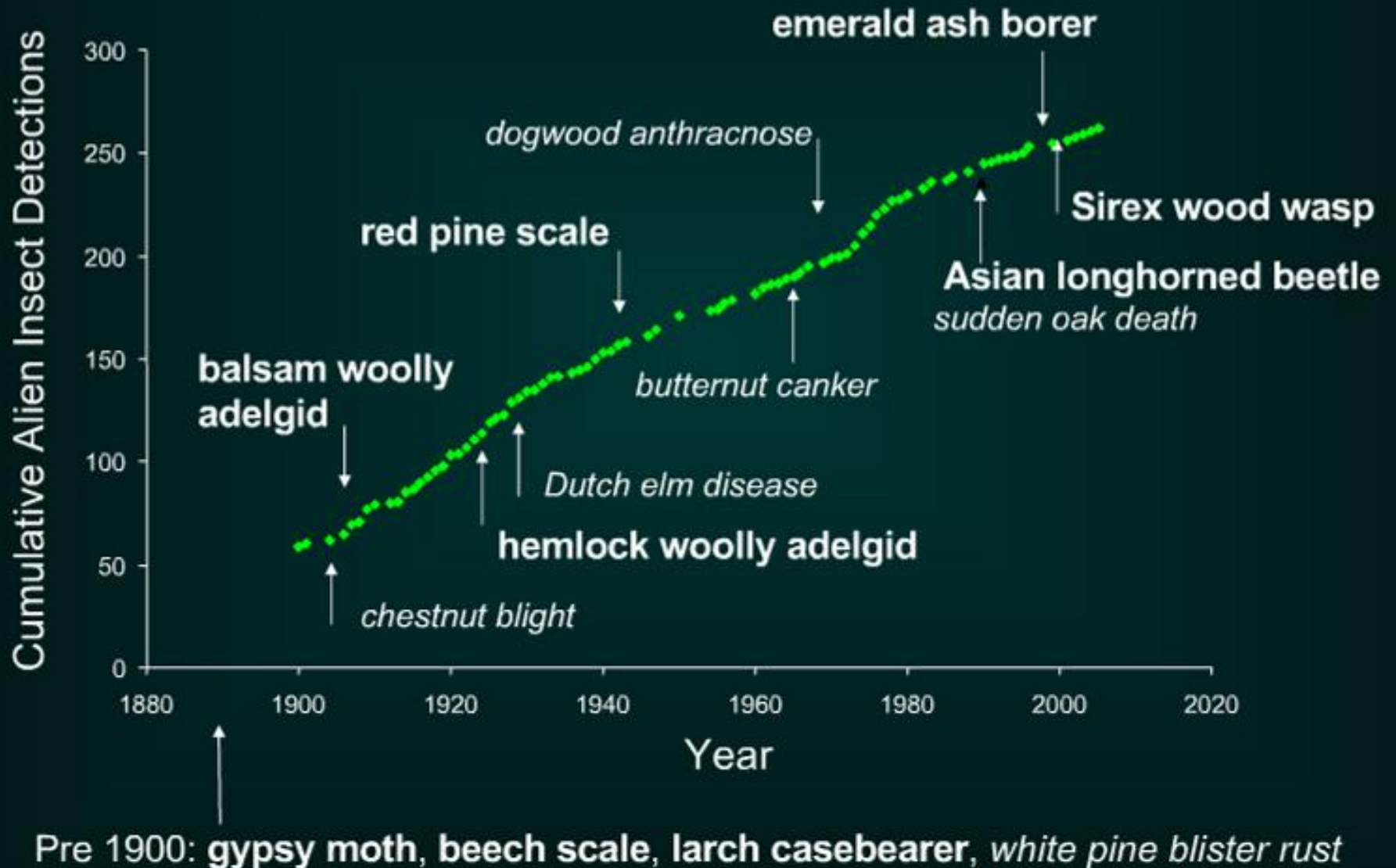


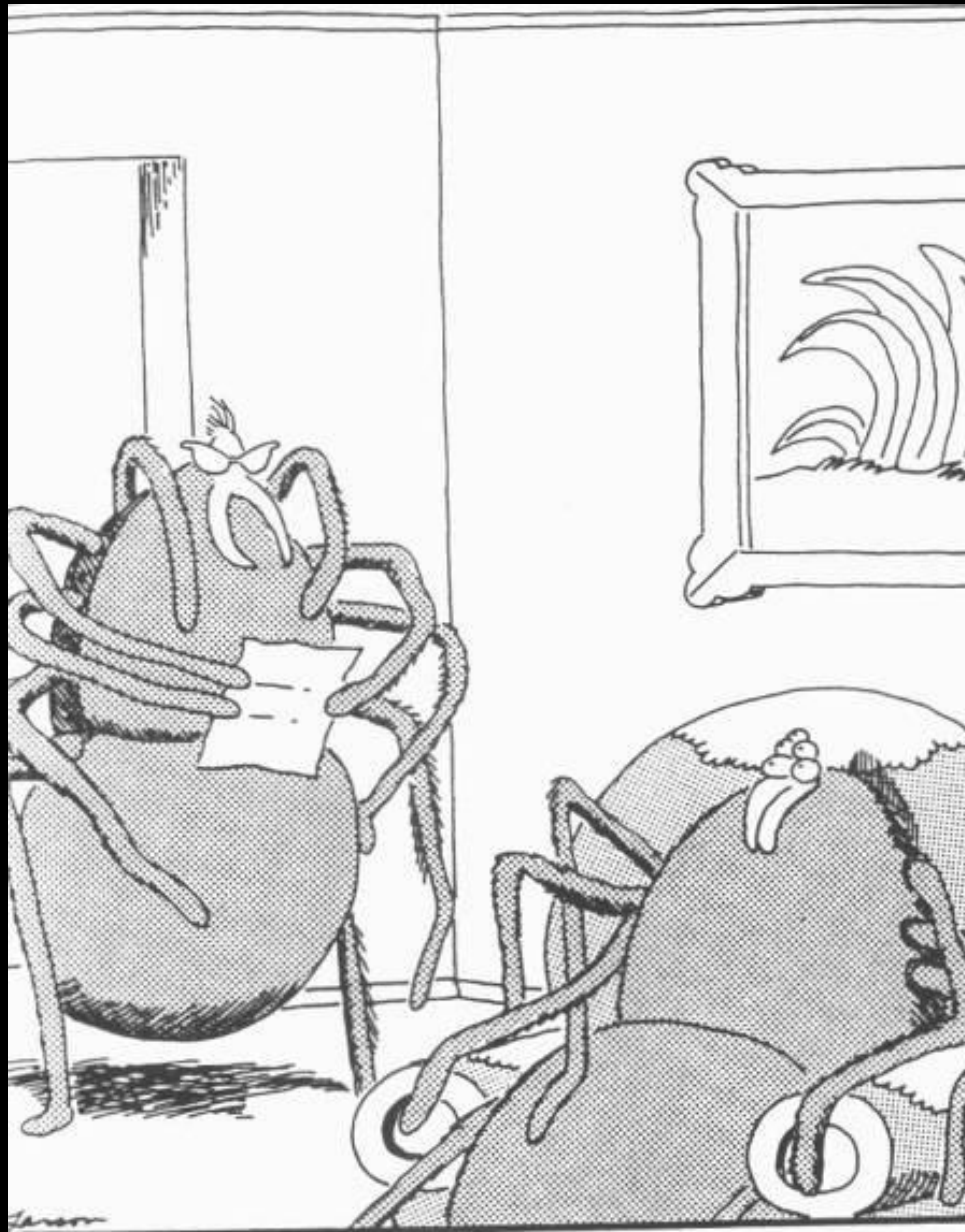
Beech Bark Disease



Healthy Beech + Scale + Fungus = Disease

Some Notable Insect & Disease Introductions





"It's a letter from Julio in America.... His banana bunch arrived safely and he's living in the back room of some grocery store."

Many Invasive Pests Can Be Moved in Firewood

- Firewood
 - Recreational
 - Camp owners
 - Commercial dealers

Take Home Message:

Buy firewood locally.

Try not to buy firewood harvested more than 50 miles away.



Firewood--recreational



Leave your Firewood at Home

Buy It Where You Burn It
Don't Give Bugs a Free Ride!



**Pack marshmallows.
Not firewood.**

www.StopTheBeetle.info
United States Department of Agriculture

Don't move firewood. Buy it at your destination.

Several pests, like the emerald ash borer in the mid-west, are killing trees and spreading to new areas.

Insects and diseases can hitchhike from your woodpile to Maine's forests when you vacation.

"Help Keep Maine's Trees Alive"

Buy firewood near your camping destination and help keep serious forest pests out of Maine.

For more information, contact the Maine Forest Service at:
<http://www.maine.gov/doc/mfs/fhm/pages/firewood.html>



Please leave your
firewood at home

- Buy local firewood
- Travel with kiln-dried wood

Asian Longhorned Beetle (ALB)



Invasion Pathway:
Solid Wood Packing Material

Spread:
Firewood, Nursery Stock

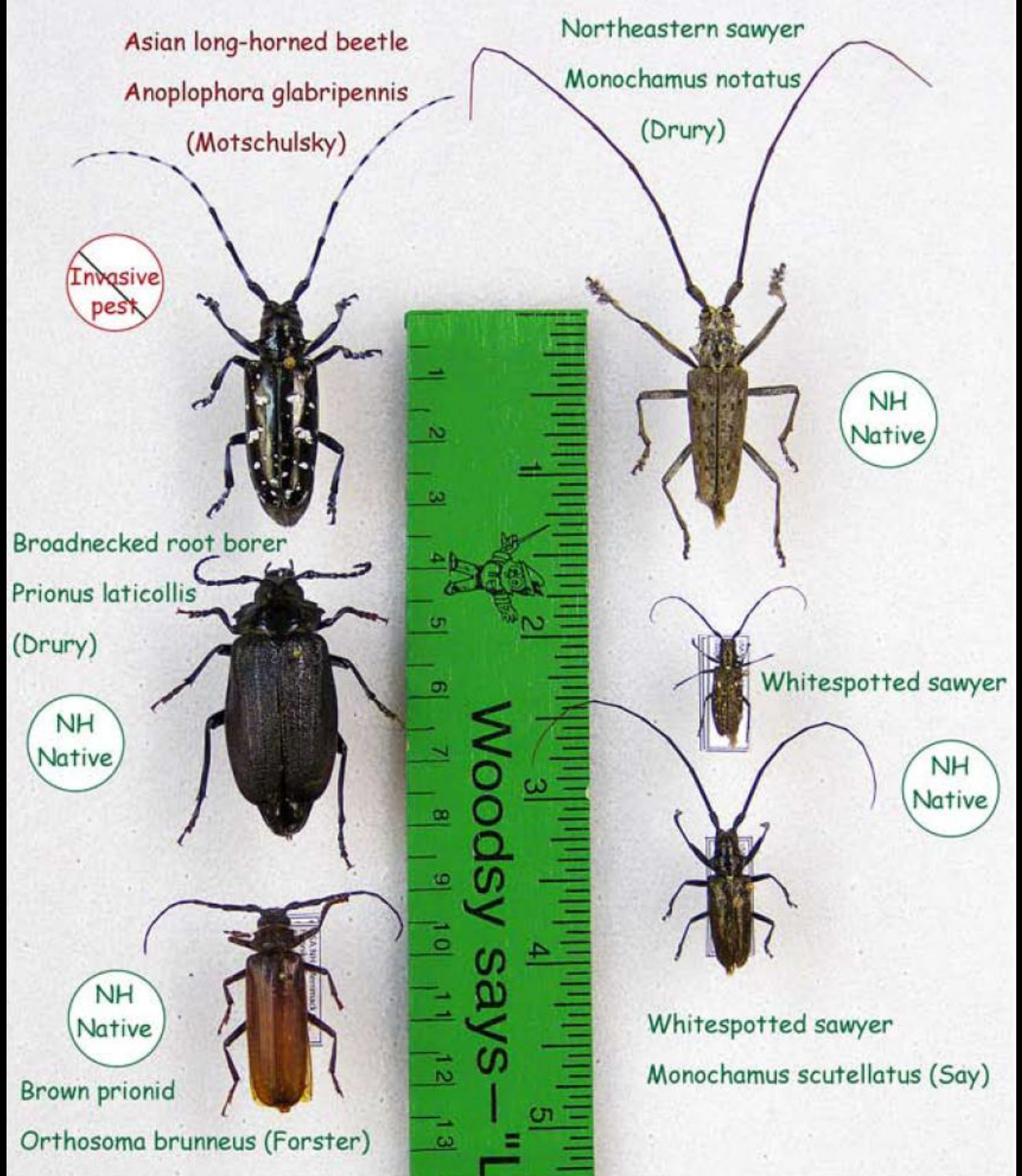


Recognizing ALB

- **Large**—1.25 to 1.5 inches—larger than a paper clip
- **Shiny**—like a bowling ball, patent leather, or a new car
- **Black**— deep dark black (not sort of black, no traces of brown)
- **White markings**—bold stripes on antennae, distinctive blotches on back (blue feet when alive)



Comparison of ALB with native beetles



Recognizing ALB

A heavily
infested tree
can look
reasonably
healthy

But look for...



Recognizing ALB



Large exit holes
(size of pencil or larger)



Egg niches
(chewing marks visible)



Tunnels
within the
wood

Recognizing ALB

Sawdust or wood shavings on limbs



Adult feeding along midribs of leaves



Oozing foaming sap



Hosts: **Maple**, Birch, Willow, Elm
Poplar, Horse-chestnut, Ash, Mountain-ash

Closest Known Infestation <110 Mi.

- Worcester, Mass and surrounding area
- Detected in August 2008 **(was present for 8-15 years before detection!)**
- High potential for **legal and innocent** movement of infested wood to homes, camps, campgrounds in Maine





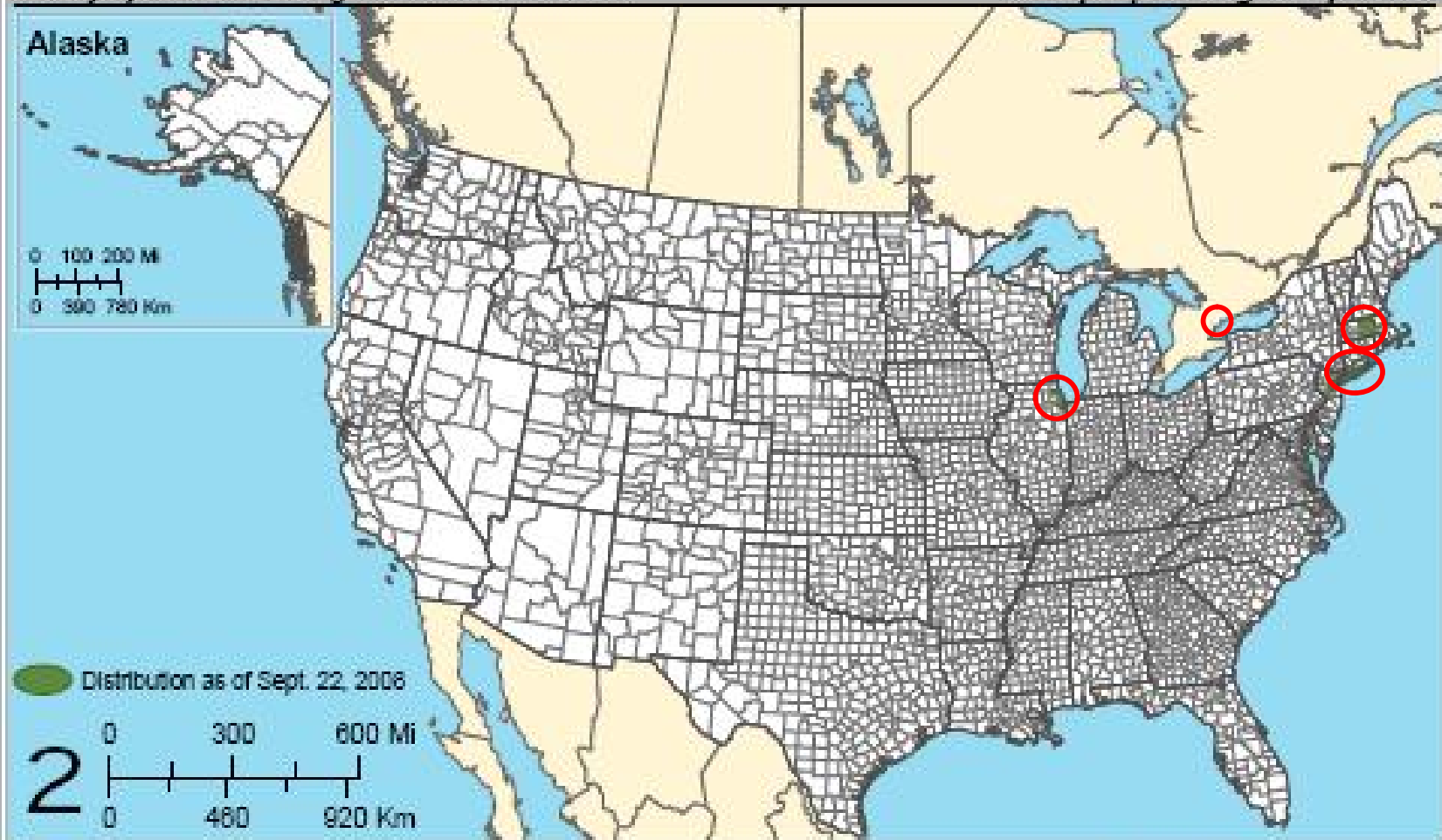
Alien Forest Pest Explorer

www.fs.fed.us/nr/morgantown/4557/AFPE/

Pest Distribution Map

Asian Longhorned Beetle

Anoplophora glabripennis



USDA
Forest Service



Northern
Research Station



Forest Health Technology
Enterprise Team



Remote Sensing
Applications Center

Also in New York, NY, New Jersey, and Toronto, ON and eradicated from Chicago.

Emerald Ash Borer (EAB)



Invasion Pathway:
Solid Wood Packing Material

Spread:
Firewood, Nursery Stock



Recognizing EAB



**Over 75% of new
infestations caused
by firewood**

- Exotic beetle (from Asia)
- Bright metallic green
- $\frac{1}{2}$ inch long
- Bores under bark of ash trees



Recognizing EAB



D-shaped exit holes



Serpentine tunneling under bark



Bark
splitting



Recognizing EAB



Crown decline
(from top down)



Epicormic growth

Impact

- Hosts
 - Attacks **all** species of North American ash
 - Kills **all** of the trees it attacks
 - Has killed over 40 million trees since 2002
 - Has the potential to wipe out whole genus of ash

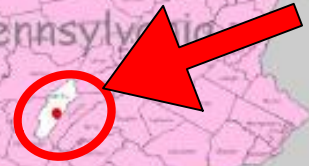
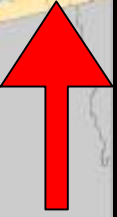


Cooperative Emerald Ash Borer Project

EAB locations in Illinois, Indiana, Maryland, Michigan, Missouri, Ohio, Pennsylvania, Virginia, Wisconsin, West Virginia and Canada

April 1, 2009

Quebec



Map Key

- EAB positive
- State or federal quarantine zone (isolated or fragmented, or unisolated)
- Federal EAB quarantine boundary
- State quarantine generally intended area
- State quarantine
- State quarantine (not)
- State or federal
- Canadian EAB regulated areas

Missouri

Wisconsin

Michigan

Ontario

Indiana

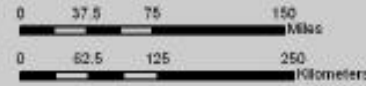
Ohio

Pennsylvania

West Virginia

Maryland

Virginia



Projection: North America Lambert Conformal Conic

Source of outbreak data:
Michigan Department of Agriculture
Michigan Department of Natural Resources
Illinois Department of Agriculture
Indiana Department of Agriculture
Ohio Department of Agriculture
Pennsylvania Department of Agriculture
West Virginia Department of Agriculture
Virginia Department of Agriculture
Maryland Department of Agriculture
Quebec Department of Agriculture
Ontario Department of Agriculture
Federal EAB Quarantine Boundary
State EAB Quarantine Boundary
State EAB Quarantine Generally Intended Area
State EAB Quarantine
State EAB Quarantine (Not)
State or Federal
Canadian EAB Regulated Areas
Data as of October 1, 2008
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News Release: Feb 25, 2009

“...Emerald ash borer has been discovered in Central Pennsylvania in Mifflin County. The infestation has most likely been there for several years. We will be coordinating our DCNR efforts with the PA Emerald Ash Borer Task Force. The infestation was reported by a landowner who sent digital photos...”

Brown Spruce Longhorned Beetle

- In Nova Scotia
- Kills all species of spruce
- Came in to Port of Halifax, NS before 1998
- Starting to see spread after hurricane in 2004 damaged wide area of forest



Brown Spruce Longhorned Beetle

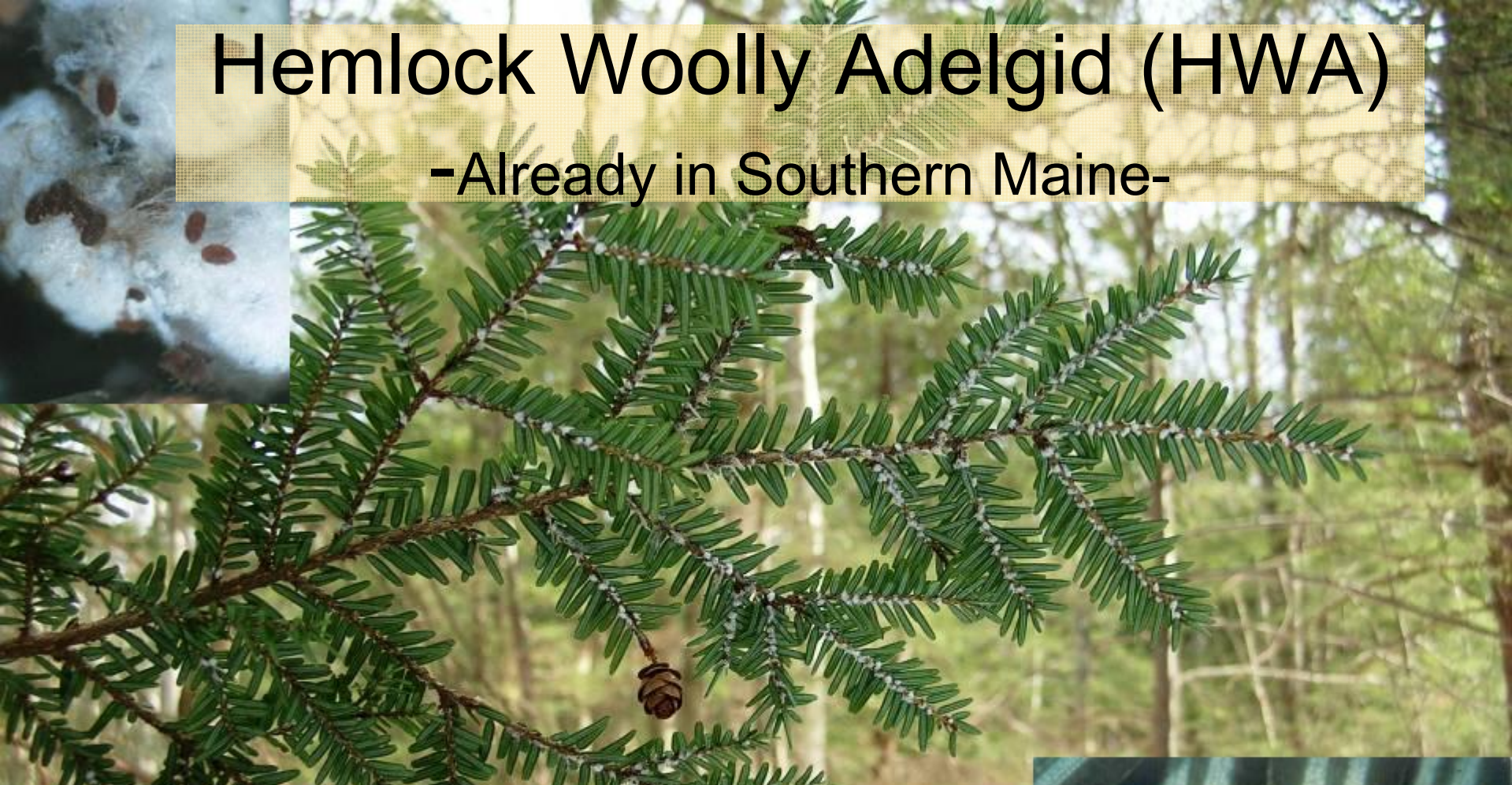
Tetropium fuscum

- Look for resin covered trunks
- Round to D-shaped 1/8" exit holes
- Can also attack fir, larch, pine



Hemlock Woolly Adelgid (HWA)

-Already in Southern Maine-



Invasion Pathway:

Accidental Introduction, Ornamental planting

Spread:

Eggs, crawlers on wind, vehicles, clothing, birds, mammals, etc.; all stages on live hemlock material



Recognizing HWA

- Hemlock
- ~1/8" or less discrete white woolly masses
- On undersides of branches
- On outer portions of branch
- Most stages immobile
- Branch dieback bottom up (vs. borer, mite)



Where in Maine is HWA found?

2003

Kittery, York

2004

Wells

2005

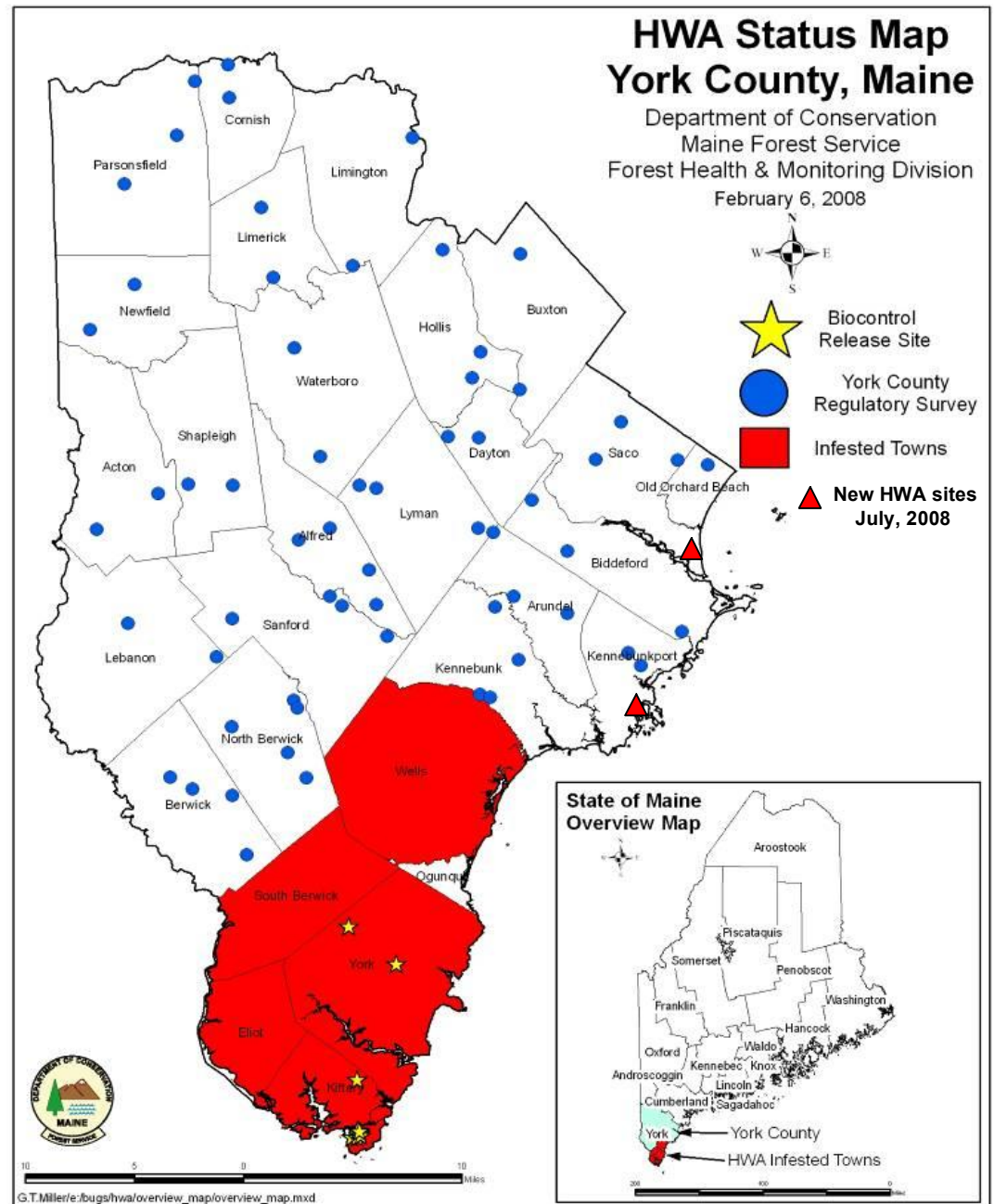
Eliot, South
Berwick

2008

Saco,
Kennebunkport

Scattered Infestations

*Note: Ogunquit is
within the HWA
quarantine.*



Impacts



Hemlock health
Water Quality
Wildlife (deer, trout)
Timber

Should I really worry, or are you just trying to scare me?

Detection methods are poor and infestations are usually not found early.

(ALB in Worcester 8-15 years before noticed)

Many of these pests may already be here: ALB, EAB

You are the best ally for your forest

There are very few entomologists state-wide – we need your help

Therefore: Be informed.

Know your forest, know what it should look like, report concerns/changes.

Know invasive threats, know what to look for, report concerns.